

AMENDMENTS TO THE CLAIMS

Please amend claims 88-89, 91-92, 97-99, 101-118, and 120-125 as follows.

Claims 1-87 (Cancelled)

88. (Currently amended) A tunable optical filter apparatus, comprising:

a grid generator to be positioned in an optical path of an optical signal and to generate a first plurality of transmission peaks at respective wavelengths corresponding to optical communication channels of a selected wavelength grid within a ~~selected~~ wavelength range of a gain medium optically coupled to the tunable optical filter; and

a channel selector to be positioned in ~~said~~ the optical path to be optically coupled to the grid generator and to generate a second plurality of transmission peaks at respective wavelengths within ~~said~~ the wavelength range, ~~said~~ the channel selector ~~including means for tuning~~ to tune the second plurality of transmission peaks relative to the first ~~set~~ plurality of transmission peaks such that a single pair of respective transmission peaks from among the first and second plurality of transmission peaks having a common wavelength may be aligned,

wherein the second plurality of transmission peaks to have one more or one fewer peaks than the first plurality of transmission peaks within ~~said~~ the wavelength range.

89. (Currently amended) The tunable optical filter apparatus of claim ~~[[89]]~~ 88, wherein ~~said~~ the grid generator has a first free spectral range and ~~said~~ the channel selector has a second free spectral range different from ~~said~~ the first free spectral range, and wherein tuning is effectuated by shifting the second plurality of transmission peaks relative to the first

plurality of transmission peaks to align one of the transmission peaks from the second plurality of transmission peaks with a transmission peak from the first plurality of transmission peaks having a wavelength corresponding to a selected optical communication channel.

90. (Cancelled)

91. (Currently amended) The tunable optical filter apparatus of claim 88, wherein at least one of ~~said~~ the grid generator and ~~said~~ the channel selector is configured to operate in transmission.

92. (Currently amended) The tunable optical filter apparatus of claim 88, wherein at least one of ~~said~~ the grid generator and ~~said~~ the channel selector is configured to operate in reflection.

Claims 93-96 (Cancelled)

97. (Currently amended) A method for tuning an optical beam, comprising:
generating a first plurality of transmission peaks having respective wavelengths corresponding to channels within a ~~selected~~ wavelength range of a laser, the laser to generate the optical beam;
generating a second plurality of transmission peaks having respective wavelengths within ~~said~~ the ~~selected~~ wavelength range; and
tuning ~~said~~ the second plurality of transmission peaks with respect to ~~said~~ the first plurality of transmission peaks to tune ~~said~~ the optical beam to a selected channel

by aligning one of the second plurality of transmission peaks with one of the first plurality of transmission peaks corresponding to the selected channel,

wherein the second plurality of transmission peaks to have one more or one fewer peaks than the first plurality of transmission peaks within ~~said~~ the wavelength range.

98. (Currently amended) The method of claim 97, wherein:

generating ~~said~~ the first plurality of transmission peaks comprises positioning a grid generator having a first free spectral range in ~~said~~ the optical beam; and

generating ~~said~~ the second plurality of transmission peaks comprises positioning a channel selector having a second free spectral range in ~~said~~ the optical beam.

99. (Currently amended) The method of claim 98, wherein tuning ~~said~~ the second plurality of transmission peaks with respect to ~~said~~ the first plurality of transmission peaks comprises adjusting ~~said~~ the second free spectral range with respect to ~~said~~ the first spectral range.

Claim 100 (Cancelled)

101. (Currently amended) A tunable optical filter apparatus for filtering an optical beam generated by a gain medium, comprising:

grid means for generating a first plurality of transmission peaks having respective wavelengths corresponding to channels in a selected wavelength range of the gain medium, ~~said~~ the grid means to be positioned in an optical path for ~~said~~ the optical beam; and

channel selector means for generating a second plurality of transmission peaks having respective wavelengths in the wavelength range, ~~said the~~ channel selector means to be positioned in ~~said the~~ optical path to be optically coupled to the grid means and to tune the optical beam by aligning one of the second plurality of transmission peaks with one of the first plurality of transmission peaks,

wherein the second plurality of transmission peaks to have one more or one fewer peaks than the first plurality of transmission peaks within ~~said the~~ wavelength range.

102. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the first plurality of transmission peaks have a constant free ~~spectrum~~ spectral range and the second plurality of transmission peaks have a variable free ~~spectrum~~ spectral range and tuning is effectuated by adjusting the variable free ~~spectrum~~ spectral range of the second plurality of transmission peaks to align one of the transmission peaks from the second plurality of transmission peaks with a transmission peak from the first plurality of transmission peaks having a wavelength corresponding to a selected channel.

103. (Currently amended) The tunable optical filter apparatus of claim 88, wherein tuning ~~said the~~ second plurality of transmission peaks ~~with respect~~ relative to ~~said the~~ first plurality of transmission peaks comprises shifting ~~said the~~ second plurality of transmission peaks relative to ~~said the~~ first plurality of transmission peaks.

104. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the grid generator defines a first optical path length determinative of a first free spectral range substantially corresponding to a spacing between adjacent gridlines of the selected wavelength grid.

105. (Currently amended) The tunable optical filter apparatus of claim 104, wherein the channel selector defines a second tunable optical path length determinative of a second tunable free spectral range which differs from the first free spectral range of the grid generator by an amount substantially equal to the quotient of the first free spectral range divided by one of a number of channels of the selected wavelength grid or the quotient of the first free spectral range divided by a subset of the number of channels of the selected wavelength grid.

106. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the grid generator and the channel selector comprise at least one of: a Fabry-Perot filter, a diffraction element, and an interference element.

107. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the channel selector includes at least one of: a Pockels cell, a Kerr cell, a solid etalon, a gap etalon, and a wedge-shaped etalon.

108. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the channel selector includes at least one of a tunable optical path length and a tunable index of refraction.

109. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the tuning of the channel selector is effected by one of: a mechanical actuator, a thermal actuator, an electro-optical actuator, and a pressure actuator ~~to tune the second plurality of transmission peaks.~~

110. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the channel selector comprises:

a gas spaced etalon tunable by adjusting a pressure of a gas within the gas spaced etalon to vary an optical path length ~~thereof~~ of the gas spaced etalon.

111. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the channel selector comprises:

an etalon responsive to an applied electric field to vary an optical path length ~~thereof~~ of the etalon.

112. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the channel selector comprises:

an etalon responsive to an applied thermal energy to vary an optical path length ~~thereof~~ of the etalon.

113. (Currently amended) The tunable optical filter apparatus of claim 108, wherein the channel selector comprises:

a semiconductor element with a tunable index of refraction responsive to an applied electric field or current to ~~vary an optical path length thereof~~.

114. (Currently amended) The tunable optical filter apparatus of claim 88, wherein the channel selector comprises:

a grating; and

an actuator for varying an angle between the grating and the optical ~~beam~~ signal to tune the optical ~~beam~~ signal to selected optical communication channels of the selected wavelength grid.

115. (Currently amended) The ~~tunable laser~~ tunable optical filter apparatus of claim 88, wherein the grid generator comprises:

an etalon; and

a thermal controller to control a temperature of the etalon to maintain the substantial alignment of the first set plurality of transmission peaks with the corresponding optical communication channels of the selected wavelength grid.

116. (Currently amended) A method for tuning an optical beam of a laser, comprising:

filtering the optical beam to define a first plurality of pass bands substantially aligned with corresponding channels in a selected wavelength grid, the selected wavelength grid having a wavelength range within a wavelength range of the laser;

filtering the optical beam to define a second plurality of pass bands within the selected wavelength grid; and

tuning the second plurality of pass bands with respect to the first plurality of pass bands to select channels at which to tune the optical beam, wherein the optical beam is tuned to a channel when one of the pass bands in the second plurality of pass bands is aligned with a pass band in the first plurality of pass bands corresponding to a selected channel,

wherein the second plurality of ~~transmission peaks~~ pass bands to have one more or one fewer ~~peaks~~ pass bands than the first plurality of ~~transmission peaks~~ pass bands within ~~said wavelength range~~ the selected wavelength grid.

117. (Currently amended) The method of claim 116, further comprising:

emitting the optical beam via a gain medium of the laser; and

optically providing feedback to the gain medium corresponding to the pass bands of the first and second plurality of pass bands that are aligned.

118. (Currently amended) The method of claim 116, wherein the tuning further comprises:

shifting the second set plurality of pass bands across a wavelength range substantially equal to one channel spacing within the selected wavelength grid to tune channels throughout the selected wavelength grid.

119. (Previously presented) The method of claim 116, wherein the tuning further comprises:

defining selectable channels by selecting either subsets of channels throughout the wavelength grid or discrete channels throughout the wavelength grid.

120. (Currently amended) The method of claim 116, wherein the filtering the optical beam to define a first set plurality of pass bands comprises:

generating a first interference within the optical beam with a first free spectral range subsequently corresponding to a wavelength spacing for the selected wavelength grid.

121. (Currently amended) The method of Claim 120, wherein the filtering the optical beam to define a second set plurality of pass bands comprises:

generating a second interference within the optical beam with a second free spectral range which differs from the first free spectral range by an amount substantially equal to the quotient of the first free spectral range divided by one of a number of channels of the selected wavelength grid or the quotient of the first free spectral range divided by a subset of the number of channels of the selected wavelength grid.

122. (Currently amended) The method of claim 116, wherein the first plurality of pass bands have transmission peaks defining a first free ~~spectrum~~ spectral range and the second plurality of pass bands have transmission peaks defining a second free ~~spectrum~~ spectral range, wherein ~~and~~ tuning is accomplished by shifting the second plurality of pass bands relative to the first plurality of pass bands to align one of the transmission peaks from the second plurality of pass bands with a transmission peak from the first plurality of pass bands having a wavelength corresponding to the selected channel.

123. (Currently amended) The method of claim 116, wherein the first plurality of pass bands have transmission peaks defining a first constant free ~~spectrum~~ spectral range and the second plurality of pass bands have transmission peaks defining a second free ~~spectrum~~ spectral range that may be varied, ~~and~~ wherein tuning is accomplished by adjusting the second free ~~spectrum~~ spectral range to align one of the transmission peaks from the second plurality of pass bands with a transmission peak from the first plurality of pass bands having a wavelength corresponding to the selected channel.

124. (Currently amended) The tunable optical filter apparatus of claim 101, wherein the first plurality of transmission peaks have a first free ~~spectrum~~ spectral range and the second plurality of transmission peaks have a second free ~~spectrum~~ spectral range and the channel selector means includes:

means for shifting the second plurality of transmission peaks relative to the first plurality of transmission peaks to align one of the transmission peaks from the second plurality of ~~pass-bands~~ transmission peaks with a transmission peak from the first plurality of ~~pass-bands~~ transmission peaks having a wavelength corresponding to a selected channel.

125. (Currently amended) The tunable optical filter apparatus of claim 101, wherein the first plurality of transmission peaks have a first constant free ~~spectrum~~ spectral range and the second plurality of transmission have a second free ~~spectrum~~ spectral range that may be varied, and the channel ~~selection~~ selector means includes:

means for adjusting the second free ~~spectrum~~ spectral range to align one of the transmission peaks from the second plurality of transmission peaks with a transmission peak from the first plurality of transmission peaks having a wavelength corresponding to a selected channel.

Claims 126-128 (Cancelled)